

Gillette (W. R.)

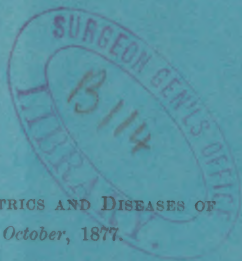
THE  
NARCOTIC EFFECT OF MORPHIA  
ON THE  
NEW-BORN CHILD,  
WHEN ADMINISTERED TO THE MOTHER IN LABOR.

BY

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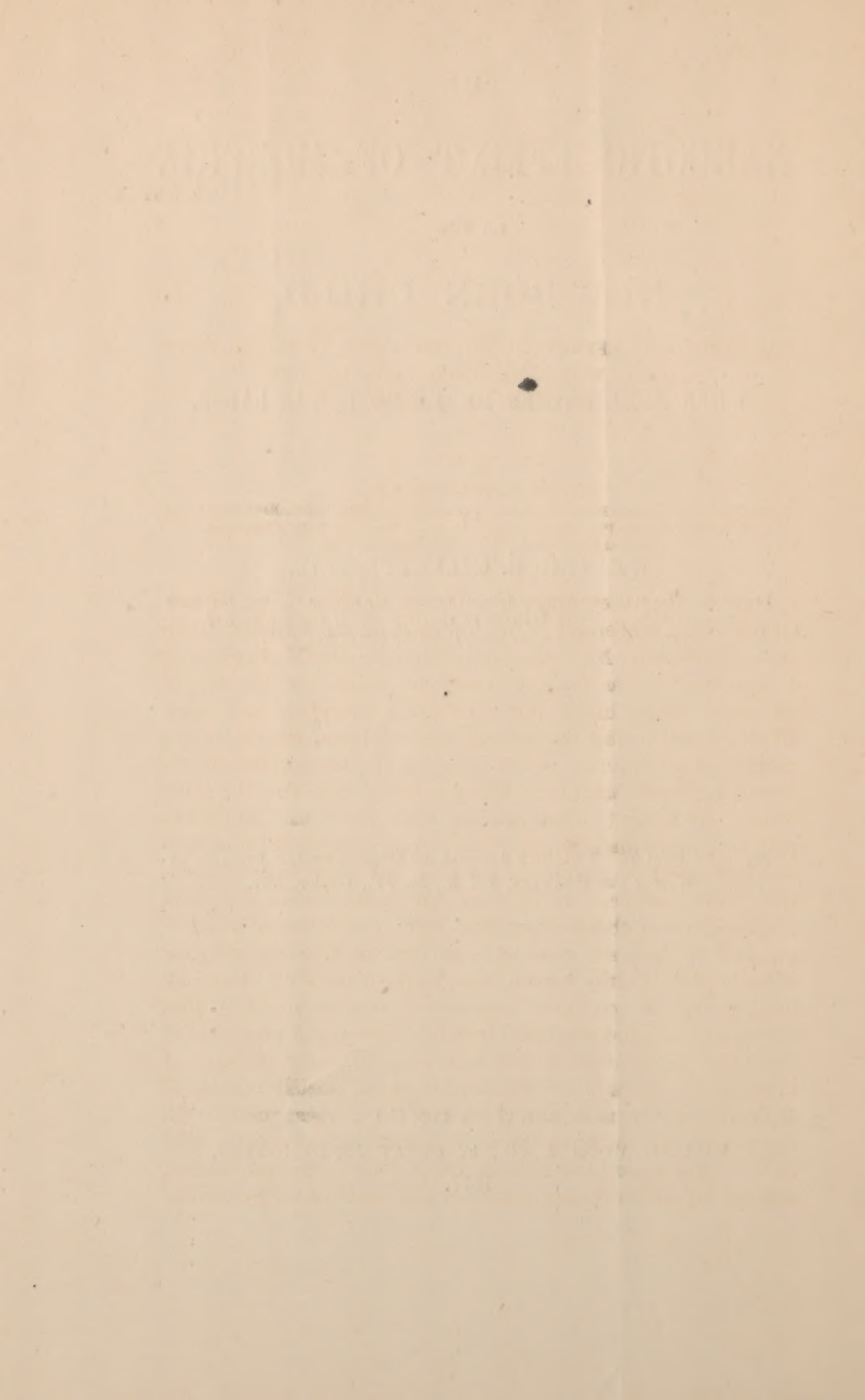
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THE NARCOTIC EFFECT OF MORPHIA ON THE NEW-BORN  
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DURING the recent discussion before the New York Obstetrical Society, concerning "The Influence on the Fetus of Medicines, particularly Narcotics, administered to the Mother during Pregnancy," it was my opportunity to present the histories of six cases where, under my observation, morphine had been administered during the second stage of labor, for the direct purpose of determining, so far as such a limited number of observations could, whether it was *possible* to narcotize the fetus in utero, in a way to be recognized after its birth. These experiments were made with a distinct bias in my mind that such an effect could be produced, and this bias arose from observations which had been thrust upon me in the varied accidents and incidents of obstetric practice. The experiments which I reported in these six cases were selected in that the subjects of them were healthy women, who, in the history of former labors, or in their condition indicated as near as might be that they were safe and comfortable child-bearers, and presented at the time of observation labors normal in every respect. I thought this attempt at elimination of all possible causes of asphyxia in the new-born necessary to a clear result. In every case the child was born in a state of *narcotism*—that is, there was a complete absence of or delay in the respiration, and the infants were only sustained and resuscitated by contin-

uing every possible method of artificial respiration. The circulation was irregular, the surface was cyanosed, the pupils contracted, the body limp and flaccid, the jaws dropped, the eye-lids half closed, and the child presented every physical appearance so common to the typical case of opium-poisoning in the adult. The condition in no case resembled any one of the forms of suspended animation in the new-born that I had ever encountered or read of, and it was then deliberately impressed upon me still more strongly than it ever had been accidentally that morphia was a dangerous remedy to use during labor, and when administered to the degree of producing its physiological phenomena in the mother, will invariably produce a *relative* condition of narcotism in the new-born infant. This statement was opposed by Drs. Barker and Peaslee, who considered morphia in labor as innocuous to the child as ether or chloroform. If I may judge by the sentiments expressed by other members of the Society, I think the general opinion was that it was a dangerous drug to administer to its full physiological effect under such circumstances. Drs. Thomas, Skene, Green and others, took a very positive stand in the matter, and unhesitatingly expressed their fear of it.

We have now to hear the other side of the question, and Dr. Lusk, in the April No. of this *Journal*, relates a series of eleven cases, in which morphia was given by Dr. Beckwith, of the Nursery and Child's Hospital, to women in labor, with an effect upon the new-born so totally opposite to that witnessed in my cases as to call for a re-examination of the subject, and renewed experimentation. First, to explain the fact that Dr. Beckwith utterly failed to repeat the results which were so marked in my cases. The Doctor administered morphia to eleven women in labor and discovered no narcotic effect in a single instance among the new-born. Therefore, Dr. Lusk's inference was apparently proper, that, "so far as deductions can be drawn from a limited number of observations, there is no reason to apprehend any direct effect to the child from morphia administered to the mother during labor." But let us examine Dr. Lusk's observations a little more closely, and see if we do not discover why Dr. Beckwith's experiments failed to repeat the results I reported. I think Dr. Lusk explains the reason of failure clearly. He says: "It cannot be objected



that the quantities of morphia given by Dr. Beckwith were insufficient, for in seven cases twelve minims of Magendie's solution were used hypodermically, in one case twenty-four minims, in another twenty-five minims, and in one three-fourths of a grain of morphia was given by the mouth and twenty-four minims of Magendie's solution were injected under the skin. In this last case, while the mother's pupils were manifestly contracted, those of the infant were unaffected. In these comparatively large doses, *it is interesting to note that though eight of the eleven women slept, and for the most part soundly, from the morphia given, none of them showed signs of labored breathing or cyanosis. The respiration, the pulse, and the size of the pupils appeared to be only moderately affected.*" This, it seems to me, is a distinct avowal that the quantities of morphia given by Dr. Beckwith *were* manifestly insufficient, inasmuch as *they failed to produce the phenomena of opium narcosis in the mothers.* The simple phenomenon of "sleep," which Dr. Lusk regarded as "the degree of narcotism of the mother," is not of itself a sufficient evidence of narcotism; it is rather the character of the sleep which renders the individual partially anesthetic to pain, and the accompanying slowing and irregularity of the respiration, with the congested, dull facies, the contracted pupil, the itching of the nose or other regions, all these and other appearances so clinically familiar make up the picture of the phenomena of opium narcosis. Dr. Beckwith's experiments, although carried out with great care and exactitude, stopped short of producing that effect with the drug which was related in my cases. Sleep is not an unusual manifestation between pains in ordinary labor when it has been severe or protracted, and taken alone is not evidence of narcosis. Why the Doctor failed to produce a sufficient effect with the *quantities* of morphia used, is not a matter of conjecture wholly either, for in Cases 1, 2, 3, 5, and 7, the drug was not administered soon enough to ensure any effect in patients who might have been more tolerant of it from the pains they were suffering. Thus, in Case 1 it was only administered forty-five minutes before labor; Case 2, twenty-five minutes; Cases 3 and 4, eighteen minutes; Case 5, eighteen minutes; Case 7, thirty minutes. In all these cases it will be observed also, that the pupils were not contracted below the

normal, as compared with the table of measurements of the pupil in the table of normal labors, and "in none of them (the eleven cases) were there signs of labored breathing or cyanosis," while "the respirations, the pulse, and the size of the pupils appeared to be only moderately affected." Surely, then, there was no decided degree of opium narcosis produced in the mothers. I have records of several cases where precisely the same results as shown, that is, where morphine had been administered to what seemed to be a *safe amount*, without producing any decided symptoms of narcosis in the mother or the child, but where the drug was given to the effect of producing a marked *degree of narcosis* in the mother, it invariably produced a relative degree of narcosis in the new-born. This will appear upon referring to the cases in the Transactions of the N. Y. Obstetrical Society, April, 1877. Since that time other observations have been made by Dr. F. Townsend, Dr. F. Parsons, of the House Staff of Charity Hospital, under my supervision and direction in the wards of the Lying-in-Department of Charity Hospital, and myself with the results related below, and these it will be seen correspond with the former observations made by Dr. Estabrook, of the House Staff, and myself. I now present fifteen additional cases where morphia was administered to the mother during the first and second stages of labor, at times sufficiently early to subject the fetus to its influence, and in labors complicated in no way, sensibly material to the danger of the child during its birth. In carrying out these observations, no attention was paid to the *quantity* of the drug given, the only desideratum being that a decided degree of narcosis should occur in some of its forms—short of utterly prostrating the woman. In conducting these observations, Dr. Townsend and Dr. Parsons maintained the greatest care and exactitude. I witnessed several of these cases in their different stages of narcosis, and we were particularly careful to push the drug to the extent reported in the former cases.

CASE I.—Second pregnancy, L. O. A. First stage ten hours' duration; second stage, ten hours and thirty-five minutes. At 11.50 A.M., 12 minims of Magendie's solution were administered hypodermically, and again 12 minims at 5 P.M., with the effect of slowing pulse from 108 to 87, and respirations from 24 to 22; though they rose again. The face was markedly flushed and dull, the pupils contracted, and the patient drowsy.



The child was born in a condition of *suspended animation*. Pupils contracted. Surface cyanosed; made a gasping effort at respiration, which could be restored by vigorous shaking and artificial respiration, but which immediately ceased when efforts were stopped. It was *twenty* minutes before respirations were regularly established, and it had to be watched two hours, as the breathing would occasionally die away. It did not cry until at least twenty minutes, and then it was more a moan than a cry, and the face indicated profound stupor, the jaw being dropped, the eye-lids half closed. This was remarked by myself and others, as almost a clinical picture of the countenance in opium narcosis in the adult. The pulse was 60, and varied between that and 120 for an hour.

CASE II.—First pregnancy, L. O. A. First stage, nine hours; second stage, two hours and three-quarters.

Gave 12 minims of Magendie at 7.50 P.M., with effect upon the mother similar to Case I., except she did not feel sleepy.

The child was born at 10.15 P.M.; weight  $6\frac{1}{2}$  lbs., in a condition of suspended animation. It was fifteen minutes before it could be made to breathe independently of artificial aid, and presented almost exactly the phenomena exhibited in Case I.

CASE III.—Third pregnancy, L. O. A. First stage, one hour; second stage, six hours. Gave 12 minims of Magendie at 4.50 A.M., with effect of reducing pulse from 80 to 60, and the respirations from 36 to 20, in an hour. At 10.30 gave 10 minims more. Mother was sleepy, with contracted pupil, and dusky facies.

Child born at 11.13 A.M.; weight,  $9\frac{1}{4}$  lbs., in a condition of suspended animation. Ten minutes after birth the respirations were only eight per minute, irregular and gasping. The pulse was 90. The pupils were contracted, and the appearances were similar to those noted in the former cases.

CASE IV.—Fifth pregnancy, L. O. A. First stage, twenty hours; second stage, twenty minutes.

Gave 12 minims of Magendie, 5.50 P.M., reducing respirations from 42 to 36. The patient was sleepy, with countenance flushed, and pupils contracted.

Child born at 8.50 P.M.; weight  $6\frac{1}{4}$  lbs. It was drowsy, breathing forty-two times per minute, five minutes after birth, and remained drowsy and lethargic for some time. The pupils were not contracted.

CASE V.—First pregnancy, L. O. A. First stage, thirty hours; second stage, twenty minutes.

Gave 10 minims of Magendie, hypodermically, at 10 A.M., July 13, slowing the respiration from 20 to 16 in an hour, producing drowsiness, itching of nose. Three hours later, patient sleeping; respirations remained at 16. At 10.15 P.M. gave 10 minims more hypodermically. Respiration 20; face dusky, and pupils contracted.

Child was born at 10.45; weight  $10\frac{1}{8}$ . Easily expelled; very cyanotic; slightly asphyxiated, and did not breathe deeply until several minutes.

CASE VI.—Second pregnancy, L. O. A. First stage, ten hours; second stage, one hour fifteen minutes.

Gave hypodermically 12 minims of Magendie's solution at 4.30 P.M., with effect of producing continuous itching of nose; drowsiness; contracted pupils, and congested facies. At 6 P.M. gave 12 minims more, with effect of continuing former symptoms. Respirations twenty.

Child was born at 7.50 P.M. Asphyxiated ten minutes before breathing was established, notwithstanding every effort to resuscitate. Surface was very blue, except white points in the trunk, which had undergone pressure during quick expulsive pains, and which slowly became of color of rest of the surface. After breathing was established, child would only cry out when slapped severely upon the nates. The pupils were contracted.

CASE VII.—First pregnancy, L. O. A. First stage, twelve hours; second stage, five hours.

Gave 12 minims of Magendie hypodermically, at 2.30 A.M., reducing the respirations in three hours from 28 to 18. At 6.30 gave ten minims more, reducing respirations from 22 to 18. At 8 A.M., gave ten minims more. Patient was now sleepy, complaining of itching of her nose. Pupils were normal as regards size, but inactive; facies darkened.

Child was born at 10 A.M. in a state of *suspended animation*. Some minutes before it began to breathe.

CASE VIII.—First pregnancy, L. O. A. First stage, ten hours; second stage, ten hours fifteen minutes.

Gave 12 minims Magendie hypodermically at 9 A.M.; also 12 minims more at 12 A.M., and again 12 minims at 2 P.M. These doses did not seem to affect the pulse or respiration. The facies darkened and pupils contracted; but, nevertheless, the child was born at 5.15 in a condition of *suspended animation*, similar to the others, and was soon brought to.

CASE IX.—First pregnancy, R. O. A. First stage, six hours; second stage, four hours.

Gave hypodermically 15 minims Magendie at 8 A.M., with the effect of drying her throat, and producing marked cutaneous irritation. Pulse and respiration not materially affected; but at 12 A.M. appeared semi-narcotized. At 12.30 gave her 10 minims more. From this time on she was dozing and drowsy, with the usual facial appearance of congestion.

The child was born at 5.50, weighing  $8\frac{1}{4}$  lbs. Its surface was very blue, its pupils were distinctly contracted, but it breathed and cried immediately.

CASE X.—Third pregnancy, L. O. A. First stage, four hours and a half; second stage, twenty-five minutes.

Gave 12 minims Magendie hypodermically at 4 A.M.; no apparent effect, except pupils somewhat contracted and feels sleepy.

Child was born at 5.55 A.M. Weight  $8\frac{1}{2}$  lbs. Breathed immediately, but was very cyanotic, and pupils contracted.

CASE XI.—First pregnancy, L. O. A. First stage, twenty-four hours; second stage, one hour and three-quarters.

Gave 10 minims hypodermically at 10.30 A.M., with effect of reducing respiration from 28 to 24 during four hours, and making



patient drowsy. Respirations went down to 18 and 16 by 5.30 p.m., when they rose at 7.36 p.m. to 26. Ten minims more were injected at 8 p.m., reducing the respiration to 20, producing itching of the nose and usual facial phenomena of narcosis; pupils contracted.

Child was born at 9.45 p.m., weighing 8 lbs. Cord was once around the neck. Asphyxia well marked. Very cyanotic. During first eight minutes after birth, gasped four times. It was twelve minutes before breathing was established voluntarily. During this time, in response to severe slapping upon the nates, it would open its eyes and slowly close them, but gave no other reflex sign of irritation. During the first five minutes after birth four or five seconds would elapse between each beat of the heart. Even when breathing was well established, the infant appeared very drowsy and benumbed, not responding to moderate irritation by pinching or slapping, and if it was severely pinched it would move the part or attempt to draw it away without a moan or a cry.

This certainly was not a case of suspended animation from cerebral congestion or anemia through pressure on the cord. The phenomena were certainly indicative of a more profound impression upon the nerve-centres. The child was bluish, not red and turgid, and respiration only responded to continued efforts.

CASE XII.—First pregnancy, L. O. A. First stage, twenty-two hours; second stage, three and one-half hours.

Gave 12 minims at 10.45 a.m. Contracting the pupils and so anesthetizing the patient that pains are not complained of. Facies dusky.

Child born at 2 p.m., weight 9 lbs. Cord was once about infant's neck, but easily slipped over the shoulder. Child was asphyxiated, breathed once in a minute and a half. Next minute, under artificial respiration, it breathed sixteen times; the next minute nothing was done, and it breathed *once*. From this time it was induced to breathe freely. Blood dribbled from the cord instead of being projected. It did not cry for five minutes, and only responded to slapping by slowly opening its eyes, closing them again, and wrinkling its face as if in pain. Pupils were small.

CASE XII.—First pregnancy, R. O. A. First stage, six hours; second stage, one and one-half hour.

Gave 16 minims Magendie at 11.30 a.m., reducing respirations from 30 to 26. Pupils contracted; face congested.

Child was born at 1.30 p.m. Asphyxiated, and did not breathe safely for three minutes.

CASE XIV.—First pregnancy, L. O. A.; first stage, 16 hours; second stage, 5½ hours.

Gave 12 minims Magendie at 8 p.m., July 25th, reducing the respirations from 26 to 22; flushing the face, irritating the nose. Respirations down to 20 in two hours, pupils contracted; sleeping between pains. At 5.20 a.m., July 26th, gave 12 minims more, with



the effect of sleep between pains, and complaining but little of them. Pupils still contracted. As the head was lingering on the perineum 3 iss. of ergot was administered at intervals of forty-five minutes, but with no effect on uterine contraction.

Child was born naturally one hour and a quarter after the first dose of ergot. Very cyanotic. Respirations catching and slow. Pupils contracted. Insensible except to rough handling.

CASE XV.—First pregnancy; R. O. P. rotated to R. O. A.; first stage 20 hours; second stage 2 hours.

Gave 15 minims of Magendie at 8.15 p.m.; effect, reducing respirations from 28 to 18; pupils contracted; rubbing nose; partial anesthesia; hardly notices labor-pains, with the head on perineum.

Child born at 12.25 a.m. Cord once about the neck; surface very blue; animation suspended. For first five minutes no respirations perceptible; heart could be felt beating very infrequently. At the end of five minutes (by the watch) gasped once; eighth minute breathed 36 times; ninth minute cried out and stopped breathing. At the eighteenth minute it was breathing but 26 times per minute. The pupils were not contracted.

It is possible that the slow delivery of the shoulders, in this case, was an element of cause in its suspended animation; but still the peculiar method of its reviving and dying away, the slowness and irregularity of the respiration, to me gives it an appearance of suffering under some other depressing influence, and presumably narcosis.

I will here summarize the cases in a table (see pp. 12 and 13), adding some details as to quantity of morphia used, and the pulse, respiration, and temperature of the child; but no inferences can be drawn from them on account of their small number.

These cases are almost a repetition of the others I reported, and seem to me to indicate something more than mere obstetric accident in their occurrence. The phenomena in the new-born were so marked, and followed so persistently the administration of the drug to the mother in quantities which insured a positive degree of narcosis, that I can only adhere to my former opinion that the administration of morphia to the degree of producing its physiological phenomena in the mother will invariably produce a *relative* degree of narcosis in the new-born. That we are enabled to determine what is the relative extent of manifestations to be expected from a given amount of the drug, is at present impossible, from the few observations which have been made. The effect of the drug is modified, as we all know, by individual idiosyncrasy, dependent upon many

varied, inherited, and acquired conditions. These we are unable to determine in any given case where we may choose to use the drug. The object of my first observations was *not* to show that morphia was an improper agent to use under any circumstances in labor, but simply to test the proposition held and taught by many—that, so far as the life of the new-born child is concerned, it is a perfectly safe remedy used to its fullest physiological extent—in other words, that it is as free from danger to the neonatus as is the administration of ether or chloroform. So far, my former observations have not been negatived. Dr. Beckwith failed in producing narcosis in the children born under his experimentation, simply because, as Dr. Lusk states, “None of them (the mothers) showed signs of labored breathing or cyanosis. The respirations, the pulse, the size of the pupils appeared to be only moderately affected.” In other words, he did not push the drug to a sufficient extent to produce even its safe phenomena. I am not surprised at this result, for we had the same experience in cases where we failed to narcotize our patients visibly; but I am quite satisfied that I *can* so deeply narcotize the woman in labor as to dangerously jeopardize, and even destroy the life of the child. I have done this. I thoroughly agree with Dr. Lusk, “that the propriety of its (morphine) use is to be determined by obstetric considerations;” but I cannot, from the standpoint of the observations made by Fehling, Kormann, Hennig, Ahlfeld, Thomas, Estabrook, Townsend, Parsons, and myself, feel, with Dr. Lusk, that “there is no reason to apprehend any direct effect to the child from morphia hypodermically administered to the mother during labor;” on the contrary, so far as we can judge by the evidence submitted, I am more convinced than ever that it is a dangerous remedy when administered without a regard to its effect upon the mother, and in the belief that it is positively powerless to do harm.

In the doses usually administered, and in the conditions of labor tolerating unusual quantities of anesthetics—quantities which, under ordinary circumstances, when an individual is not suffering great pain, and is not in a condition of *resistance* to its effects, would, in many instances, destroy life—it is, to a certain degree, a safe remedy, and generally a mere placebo; *but that it can, by injudicious or reckless administration, destroy fetal life during labor, I have no doubts at present.*

TABLE I.

No. of Preg- nant and Child.	Length of 1st Stage.	Length of 2d Stage.	Time under Influence of Narcotic.	Effects on Mother.	Condition of Child at Birth.	Minimum of Mogen- dion ad- ministered	Pulse.	Child's Temp.	Resp.
1 L. O. A.	10 hrs.	2½ hrs.	6 hours.	Pulse reduced, 108 to 87; res- piration, 24 to 22; pupils con- tracted; face suffused and dull; patient drowsy.	Suspended animation; pupils contracted; surface cyanosed; twenty minutes requir- ed to re-stablish respirations; drowsy, with dropped jaw and eyelids half closed; watched two hours.	24	15 m. after birth, 60; 1 h. after, after, 108, 94°.	15 m. after birth, 99°; 1 h. after, 1 h. after, 66.	15 m. after birth, 40; 1 h. after, 1 h. after, 66.
2 L. O. A.	9 hrs.	2½ hrs.	2 h. 25 min.	Pulse, 80 to 72; respiration 20; face suffused; pupils con- tracted.	Suspended animation; pupils contracted; surface cyanosed; facies dull and drowsy; fifteen minutes before respiration safely established.	12	15 m. after birth, 120, 95°; 1 h. after, 1 h. after, 118.	15 m. after birth, 95°; 1 h. after, 1 h. after, 95°.	15 m. after birth, 40; 1 h. after, 1 h. after, 66.
3 L. O. A.	1 hr.	6 hrs.	6 h. 23 min.	Pulse reduced from 80 to 60; respirations from 36 to 30; pupils contracted; facies dis- tinctly sleepy.	Suspended animation; pupils contracted; two minutes after birth respirations 8 per minute, precordial and gasping; pulse, 90; facies dull and drowsy.	32	15 m. after birth, 120; 1 h. after, after, 114, 95°.	15 m. after birth, 95°; 1 h. after, 1 h. after, 95°.	15 m. after birth, 40; 1 h. after, 1 h. after, 66.
4 L. O. A.	20 hrs.	20 min.	3 hours.	Pulse increased from 96 to 100; respirations decreased from 42 to 36; pupils contracted; fa- cies dull and flushed; sleepy.	Child born drowsy; remaining lethargic for some time; respirations at first, 42; pupils not contracted.	12	15 m. after birth, 122; 1 h. after, 1 h. after, 121.	15 m. after birth, 95°; 1 h. after, 1 h. after, 95°.	15 m. after birth, 40; 1 h. after, 1 h. after, 66.
5 L. O. A.	20 hrs.	30 min.	12 h. 15 min.	Pulse increased from 74 to 74; respirations increased from 30 to 14; pupils contracted; nose itching; face dusky, sleepy.	Slightly asphyxiated, very cyanotic; did not breathe deeply for several minutes.	20	5 m. after birth, 104; 23 m. af- ter, 122.	5 m. after birth, 98°; 23 m. af- ter, 100°.	5 m. after birth, 40; 23 m. af- ter, 40.
6 L. O. A.	10 hrs.	1½ hrs.	7 h. 10 min.	Pulse increased from 88 to 100; respirations varied between 16 and 24; no permanent de- crease; pupils contracted; countenance flushed; great cutaneous itching; sleepy.	Suspended animation; ten minutes before breathing was established; surface very cyanotic; child almost insensible to pain for some time; pupils contracted.	24	15 m. after birth, 120; 2 h. after, 120°.	15 m. after birth, 94°; 2 h. after, 5 h. after, 90°.	15 m. after birth, 40; 5 h. after, 5 h. after, 60°.
7 L. O. A.	12 hrs.	2 hrs.	7 h. 30 min.	Pulse decreased, 84 to 78; re- spiration from 28 to 18; pupils normal but inactive; facies darkened; marked cutaneous itching; sleepy.	Suspended animation, some minutes before it began to breathe.	32	30 m. after birth, 112.	30 m. after birth, 98°.	30 m. after birth, 40.



8	1 L. O. A.	10 hrs.	2½ hrs.	7¼ hrs.	No apparent permanent effect upon pulse or respiration; marked cutaneous irritation; face flushed.	Suspended animation; resuscitated in a few minutes.	36	15 m. after birth, 140; 1 h. after, 156.	98°.	15 m. after birth, 50; 1 h. after, 48.
9	1 R. O. A.	6 hrs.	4 hrs.	9 h. 50 min.	No permanent effect upon pulse or respirations; throat dry; marked cutaneous irritation; very drowsy; face flushed.	Very cyanotic; pupils distinctly contracted, but breathed immediately and cried.	25	10 m. after birth, 144; 30 min. after, 146.	100¼°.	10 m. after birth, 54; 30 min. after, 52.
10	3 L. O. A.	4¼ hrs.	25 min.	1 h. 55 min.	No apparent effect, except pupils somewhat contracted, and feels sleepy; face somewhat flushed.	Very cyanotic; pupils contracted, but breathed immediately.	12	10 m. after birth, 140; 40 min. after, 134.	98°.	10 m. after birth, 60; 40 min. after, 44.
11	1 L. O. A.	24 hrs.	1¼ hrs.	11¼ hrs.	Pulse reduced from 90 to 66; respirations, 28 to 16; marked cutaneous irritation; pupils contracted; facies dusky.	Suspended animation; very cyanotic; during first eight minutes gasped four times, twelve minutes before respiration established; dull, drowsy, and insensible to pain; cord once around neck loosely.	20	25 m. after birth, 128.	97¼°.	25 m. after birth, 35.
12	1 L. O. A.	22 hrs.	3½ hrs.	3¼ hrs.	Pulse, 88 to 80; respirations not materially affected; pupils contracted; almost anesthetic to pain; face flushed; pupils contracted.	Suspended animation; breathed once in a minute and a half; next minute artificial stimulus, 16 times; next minute, being left alone, breathed once; almost insensible to pain; very cyanotic; pupils small; blood dribbled from cord; cord once about neck loosely.	12	10 m. after birth, 80; 20 min., 166.	100°.	Not noted.
13	1 R. O. A.	6 hrs.	1½ hrs.	2 hrs.	Pulse reduced from 84 to 80; respiration from 30 to 20; pupils contracted; face flushed.	Suspended animation; did not breathe safely for three minutes.	15	5 m. after birth, 140.	94¼°.	5 m. after birth, 48.
14	1 L. O. A.	16 hrs.	5½ hrs.	12½ hrs.	Pulse reduced from 104 to 88, but varied between this and 94; respiration from 26 to 20; pupils contracted; face flushed; sleeping, and almost anesthetic to pain; ergot administered, but no effect on pain.	Very cyanotic; respirations catching and slow; increased irregularly for 30 minutes; pupils contracted; insensible, except to rough handling.	24	30 m. after birth, 148.	99⅞°.	30 m. after birth, 70.
15	7 R. O. A.	20 hrs.	2 hrs.	4 h. 10 min.	Pulse reduced from 134 to 105; respirations, 38 to 18; pupils contracted; face flushed; cutaneous irritation; almost anesthetic to pain.	Animation suspended; very cyanotic; did not breathe for five minutes, then gasped once; 8th minute, breathed 36 times; 9th minute, cried out and stopped breathing; resuscitated, and 11th minute breathed 46 times; 18th minute, pulse, 106; resp., 20; pupils not contracted, and but slightly sensible to gas-light; was indifferent to rough handling, washing, and dressing; cord once around the neck.	15	8 m. after birth, 106; 1 h. after birth, 116.	94°.	8 m. after birth, 36; 1 h. after, 48.







